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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,823	11/01/2000	Michael A. Davis	712-002-104	4186

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EXAMINER	
LYONS, MICHAEL A	
ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/703,823	DAVIS ET AL.	
	Examiner	Art Unit	
	Michael A. Lyons	2877	

-- The MAILING DATE of this communication appears on the cover sh t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

In view of the appeal brief filed on December 8, 2003, PROSECUTION IS HEREBY REOPENED. See the revised rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim are rejected under 35 U.S.C. 103(a) as being unpatentable over Kringlebotn et al (6,097,487) in view of Farhadiroushan (5,754,293) and in further view of Galvanauskas et al (5,499,134).

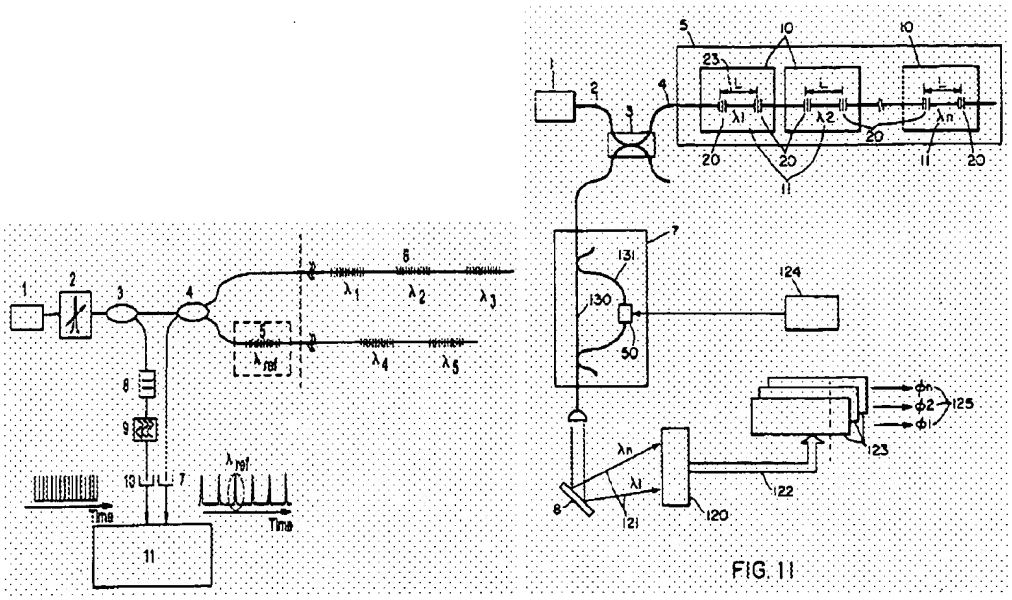

FIG. 11

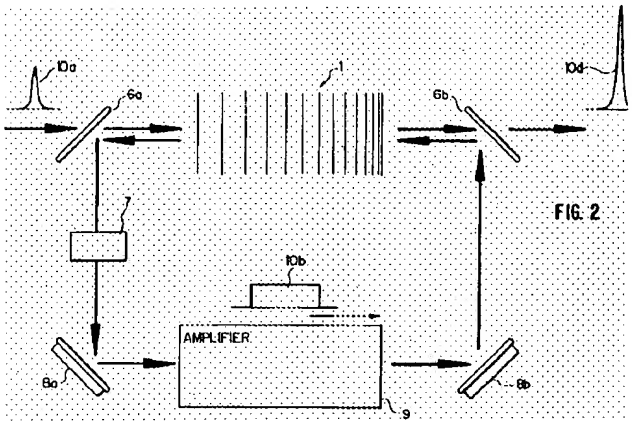

FIG. 2

With regard to claim 1, Kringlebotn discloses a broadband light source 1 and a Bragg grating 5 with a known reference wavelength. The figure only shows grating 5 to be a single grating; however, Kringlebotn discloses both in his abstract and in column 4, lines 49-50 of the specification that the reference Bragg grating 5 is "at least one FBG . . . with a known wavelength providing an accurate wavelength reference", leaving open the possibility that the reference grating is comprised of a plurality of Bragg gratings. Additionally, the use of chirped Bragg gratings is not disclosed.

Farhadiroushan teaches (Fig. 11) a device whereby pairs of in-line fiber gratings 20, each grating having the same wavelength, are used to select and reflect a certain group of wavelengths. Furthermore, Galvanauskas (Fig. 2) discloses the use of a system comprising a chirped fiber Bragg grating 1 that can stretch and compress pulses by a desired amount depending on the construction of the grating.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the reference Bragg grating of Kringlebotn a chirped Bragg grating etalon as per Farhadiroushan and Galvanauskas to better facilitate the passage of a spectrum of wavelengths through the etalon as per the claimed invention for a reference measurement, as the use of chirped Bragg gratings offer "unprecedented compactness, robustness, and system efficiency" (Galvanauskas abstract, lines 7-8).

With regard to claim 16, the broadband light source and chirped Bragg grating etalon are discussed above. In addition, the Bragg gratings of Farhadiroushan may be contained in optical fiber waveguides, as the specification states "the wavelength filter means may be a wavelength selective grating inside an optical fib[er] waveguide" (Col. 3, lines 10-11).

As for claim 2, the line "at least one fibre Bragg grating" can be read to mean a pair of gratings.

As for claims 3-4, 8, and 17, Galvanauskas (Col. 2, lines 47-65) discloses the effects of spacing of the chirped gratings, along with the appropriate results, showing that the desired wavelengths can be reflected back from the grating according to the chirping of the grating.

As for claim 5, Kringlebotn discloses an optical filter 8.

As for claim 6, Kringlebotn shows an optical band pass filter 9.

As for claim 7, while a Fabry-Perot filter 8 is disclosed, a Bragg grating can be substituted for the same effect.

As for claim 9, the Fabry-Perot filter disclosed has a "fixed and known free spectral range" (lines 10-11, abstract), making it a selective dielectric filter.

As for claim 10, while the Fabry-Perot filter is disclosed, a Bragg grating can be substituted for the same effect.

As for claim 11, Kringlebotn shows an optical band pass filter 9.

As for claim 12, Kringlebotn discloses an optical filter 8.

As for claims 13 and 14, the device discloses optical couplers 3 and 4.

As for claim 15, while the Fabry-Perot filter is disclosed, a Bragg grating can be substituted for the same effect.

As for claims 18-20, Galvanauskas (Col. 2, lines 47-65) discloses the effects of spacing of the chirped gratings, along with the appropriate results, showing that the desired wavelengths can be reflected back from the grating according to the chirping of the grating. Additionally, all broadband sources have spectrums, and chirped Bragg grating etalons are designed to pass certain wavelengths of light while reflecting others.

Response to Arguments

Applicant's arguments filed December 8, 2003 have been fully considered but they are not persuasive. Firstly, the following is a repeat of the arguments in the examiner's previous final office action. The thrust of the applicants' argument is a detailed description of why the combination of Kringlebotn et al in view of Farhadiroushan fails to accurately represent the claimed invention. Essentially, the

substitution of the "in-line fiber Bragg grating pairs" (page 11, paragraph 2 of applicants' response), such as depicted by element 10 of Figure 1, for the reference grating 5 in Figure 1 of Kringlebotn is wrong, as there is no motivation, according to the applicants', for such a substitution. Additionally, neither Kringlebotn nor Farhadiroushan disclose the use of chirped Bragg gratings leading to a chirped Bragg grating etalon.

Motivation does exist, however, for the combination and substitution of the Kringlebotn and Farhadiroushan devices. From the above rejection: "Kringlebotn discloses both in his abstract and in column 4, lines 49-50 of the specification that the reference Bragg grating 5 is 'at least one FBG . . . with a known wavelength providing an accurate wavelength reference'". This statement provides the motivation for modifying the single reference grating 5 depicted in Figure 1, as "at least one FBG" can mean just one, or mean two or more. It should be noted that the remaining set of Bragg gratings 6 is not being ignored; rather, the issue at hand is the reference grating, since the claims are only directed toward providing optical reference signals, such as the reference grating 5.

Since the statement of Kringlebotn above is not explicit in its reference to the exact number of reference gratings are present, the device of Farhadiroushan is turned to. As stated by the applicant, Farhadiroushan contains "in-line fiber Bragg grating pairs", essentially, a fiber Bragg grating etalon. While Farhadiroushan's device is a sensing device, the fiber Bragg grating etalon "includes a wavelength filter for selecting a band of wavelengths" (abstract, lines 3-4), with each etalon responsible for selecting a specific wavelength. As the etalon serves the purpose of selecting a specific wavelength, much like the reference grating of Kringlebotn is responsible for selecting a specific reference wavelength, the combination is valid.

Finally, while neither Kringlebotn nor Farhadiroushan uses chirped Bragg gratings or chirped Bragg grating etalons, the practice of chirping Bragg gratings is well known. Chirped Bragg gratings and their uses are disclosed and described in US Pat. No. 5,499,134 to Galvanauskas et al, making them well known. In addition, in the abstract, lines 5-8, states the following: "When used in chirped pulse amplification systems instead of bulk diffraction grating stretchers and compressors, Bragg gratings offer unprecedented compactness, robustness, and system efficiency". This statement, along with the abstract as a whole, explain the advantages of using a chirped Bragg grating, making the chirping of a normal Bragg grating etalon not only well known, but beneficial to the system as a whole as well.

Attention will now be drawn to a few salient points in the new arguments found in the brief for appellants. First, the examiner has noticed that the brief indicates that claims 1, 4, and 20 will be argued separately. However, after reading the argument, it appears that only claim 1 has been argued. There is a single mention of claim 20, by number, in the arguments, but no mention of the details in the claim, or of anything regarding claim 4, in the arguments.

The arguments relating to the Kringlebotn reference are drawn to the reference grating, element 5. As stated previously in the rejection and the arguments, the abstract points out that the reference grating consists of "at least one fiber Bragg grating". In the course of arguing that, if the grating can be read as more than one grating, the applicants turn to Figure 5 to point out that the reference grating in that embodiment consists of two gratings at different wavelengths, grating 5a and 5b. However, in another embodiment, Figure 4, the reference grating includes multiple gratings 5 of the same wavelength.

Additionally, the applicants argue that there is no motivation to use (substitute or combine) the etalon in the sensing device Farhadiroushan for the reference Bragg grating(s) in the measurement device of Kringlebotn. While the terms "sensing" and "measurement" may differ, for a measurement device to work, it must sense or detect, in some way, the signal or light or other means before it can operate to make its measurement. Furthermore, the application of the teachings of Farhadiroushan (and, to an extent, Galvanauskas), is not a wholesale substitution of the element in one device for the element in another. Rather, it is a modification of the element in the primary reference to further enhance the operation of the apparatus for reasons already disclosed. There is no indication in the above arguments that the combination is performed through a simple substitution.

Finally, in response to the applicants' argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in any sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the invention was made, and does not include knowledge gleaned only from the applicants' disclosure, such a reconstruction is proper. *In re McLaughlin*, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971). As shown from the references, using fiber Bragg grating etalons and chirped Bragg gratings are within the level of one of ordinary skill in the art. The applicants' arguments lead to the admission that chirping Bragg gratings are within the level of ordinary skill in the art as well.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAL
April 7, 2004

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Technology Center 2800